Why is Bar (Module) Width Adjustment Important for QR codes?

Unlike linear bar codes, 2D bar codes have another feature which sets them apart. The feature is "error correction." Error correction (EC) occurs when the scanner/camera/imager has difficulty decoding the image. The EC slows down the response time while it goes through its error correcting decoding algorithm. The EC can be a relatively short period of (a second or less) time or it can be rather lengthy (multiple seconds). When you combine the difference in scanner/camera/imager capabilities AND image quality, the error correction process should be taken into consideration since it does affect the consumer perception of the product or company encoded in the message. Think about the message it sends to the consumer if it takes 10 or 15 seconds to decode the symbol.

One of the best ways to reduce the amount of error correction is to ensure that image is of good quality. To start, you must make sure all the modules are aligned correctly center to center both horizontally and vertically. In addition, the bars in the finder pattern (the 4 squares you see in the symbol) and all contiguous bars are connected.

Fig 1 shows all the modules in a typical QR code

Figure 1

Fig 2 shows a symbol with no bar width adjustment. The bar/spaces/modules are uniformly centered but they are wider than mid-point and the error correction will slow down the decoding process.

Figure 2

Fig. 3 shows bar (module) width adjustment made correctly. The finder pattern is solid, the modules are adjusted the same amount on all four sides. Your image should look like this at the prepress stage, and it may look like this if the print quality is very good.

Figure 3

There is a popular misconception that bar/module width adjustment for QR codes is not necessary. However, this approach will likely generate less than optimum performance of the QR image.